

## **EPA's Designations for PM<sub>2.5</sub> Nonattainment Areas in New England Questions and Answers**

### **What is EPA announcing today?**

On December 17, 2004, EPA notified the public whether their area has a fine particle air quality problem, or is contributing to a problem nearby. This action, known as "designating" areas as meeting or not meeting the new, more protective fine particle standards, is an important step in helping states and local governments improve air quality. Areas that do not meet the standards are called nonattainment areas. These areas have (or contribute to) fine particle levels higher than allowed under EPA's fine particle national air quality standards.

### **What are the fine particle (PM<sub>2.5</sub>) standards?**

In July 1997, as the result of scientific studies indicating that the existing particulate matter (PM) standards for particles smaller than 10 micrometers (or 1/100 of a millimeter), referred to as "PM<sub>10</sub>", did not adequately protect public health, EPA established new standards based on particles smaller than 2.5 microns (or "PM<sub>2.5</sub>"). Scientific information shows that fine particles can affect human health at low levels and that these effects increase with pollutant concentration and exposure time. The PM<sub>10</sub> standards, which remain in effect, limit PM<sub>10</sub> concentrations to 50 micrograms per cubic meter based on an annual average, and 150 micrograms per cubic meter based on a 24 hour average. The new PM<sub>2.5</sub> standards limit PM<sub>2.5</sub> concentrations to 15 micrograms per cubic meter based on an annual average, and 65 micrograms per cubic meter based on a 24 hour average. In 2003, there were 20 days in New England when some part of the region experienced unhealthy fine particle concentrations.

### **What is PM<sub>2.5</sub>?**

PM<sub>2.5</sub> is a chemically and physically diverse mixture of air-borne particles and droplets, composed of sulfate, nitrate and ammonium, water, black carbon (also called "elemental carbon"), a large variety of organic compounds, and crustal material. It exists in the air in a range of particle sizes, from submicrometer to more than 30 micrometers in diameter. The composition of particles varies, depending on their source and age. PM<sub>2.5</sub> is referred to as "primary" if it is directly emitted into the air as solid or liquid particles, and is called "secondary" if it is formed by chemical reactions of gases in the atmosphere. Major sources of primary fine particles include cars and trucks, especially those with diesel engines; open burning of wastes; wildfires; fireplaces; cooking; dust from roads and construction; agricultural operations; and coal and oil-burning boilers. Major sources of secondary fine particles are power plants and some industrial processes, including oil refining and pulp and paper production.

### **What are the health effects associated with exposure to PM<sub>2.5</sub>?**

Fine particles are unhealthy to breathe - especially for people with heart, respiratory, and lung diseases, and for children and adults who are active outdoors. Fine particle pollution can irritate a person's airways, reduce lung function, aggravate asthma, and inflame and damage the cells lining the lungs, contribute to cardiovascular problems such as heart attacks and cardiac arrhythmia, and even cause death.

**How did EPA establish the PM<sub>2.5</sub> Standards?**

EPA issued the PM<sub>2.5</sub> standards in July 1997, based on information demonstrating that the PM<sub>10</sub> standards did not adequately protect public health. Scientific information shows that PM<sub>2.5</sub> can affect human health at low levels and that these effects increase with pollutant concentration and exposure time. The U.S. Supreme Court upheld the EPA's approach to setting the PM<sub>2.5</sub> standards in February 2001. In late 2002, all remaining legal challenges were cleared. EPA is currently preparing an PM<sub>2.5</sub> implementation rule that outlines requirements for nonattainment areas. This final rule will describe actions that are required by states to address nonattainment areas, including implementation of programs to reduce emission from local and regional sources.

**What areas in New England are affected?**

EPA has designated two Connecticut counties (i.e., New Haven and Fairfield Counties) as nonattainment for the PM<sub>2.5</sub> standards. These counties have been included as part of a multi-state nonattainment area which encompasses the New York City metropolitan area, and includes 10 counties in northern New Jersey and 10 counties in downstate New York. All other areas in New England have been designated attainment/unclassifiable with the PM<sub>2.5</sub> standards.

**Why does EPA designate areas as nonattainment?**

To protect public health, the Clean Air Act requires state and local governments to take steps to control fine particle pollution in areas that do not meet or contribute to areas that do not meet air quality standards. These steps may include requiring pollution controls on power plants and industrial facilities as well as additional planning requirements for transportation projects. State governments must explain these control requirements in their state implementation plan (SIP). States must revise their plans to demonstrate how they will meet the PM<sub>2.5</sub> standards and submit their revised plan to EPA in early 2008.

Nonattainment areas are subject to a measure known as "transportation conformity," which requires local transportation and air quality officials to coordinate planning to ensure that transportation projects, such as road construction, do not affect an area's ability to reach its clean air goals. Transportation conformity requirements become effective one year after an area is designated as nonattainment. Once designated, nonattainment areas also are subject to New Source Review (NSR) requirements. NSR is a permitting program for industrial facilities to ensure that new and modified sources of pollution do not impede progress toward cleaner air.

**How did EPA make these designations?**

Based on air quality and other factors, states and tribes made recommendations to EPA in February 2004 regarding areas that do not meet the PM<sub>2.5</sub> standards. In June 2004, EPA responded to those recommendations with letters describing the changes the Agency intended to make to state and tribal recommendations. EPA also requested that states provide additional information if they wanted to bolster their original recommendation regarding nonattainment boundaries. Based on all information we received, on December 17, 2004, EPA finalized the boundaries of the nation's nonattainment areas. EPA will publish the notice of our decision in the Federal Register. This notice is the legal document codifying the nonattainment boundaries. Ultimately, the list of nonattainment areas will be published in the Code of Federal Regulations (40 CFR Part 81).

**How did EPA and the states obtain the air quality data underlying the PM<sub>2.5</sub> designations?**

With financial and in-kind support from EPA Region 1, the six New England states operate a robust network of over 120 PM<sub>2.5</sub> ambient air quality monitors. Over the last seven years, EPA has awarded the New England states almost \$20 million to implement this air monitoring program. These grants are used to support the states' air quality monitoring programs and to provide funds to install and operate these air monitoring stations, analyze the samples, provide quality assurance, and interpret the data. These networks provide the monitoring data used to determine attainment/nonattainment, measure progress and trends, and warn the public when air quality levels are unhealthy. The monitoring network in New England included over 120 different PM<sub>2.5</sub> monitors, which provided data that was used, in conjunction with other information, as the basis of the December 17, 2004 announcement of PM<sub>2.5</sub> nonattainment areas. The following table provides state-by-state information on EPA's financial support for the PM<sub>2.5</sub> air quality monitoring programs operated by the New England states.

<b>EPA PM<sub>2.5</sub> Air Monitoring Grants to New England States</b>								
<b>Year</b>	<b>CT</b>	<b>ME</b>	<b>MA</b>	<b>NH</b>	<b>RI</b>	<b>VT</b>	<b>NESCAUM*</b>	<b>Regional</b>
1998	\$525,000	\$504,000	\$707,000	\$393,000	\$282,000	\$252,000		\$2,663,000
1999	\$571,000	\$489,000	\$879,000	\$310,000	\$324,000	\$199,000		\$2,772,000
2000	\$693,000	\$417,000	\$806,000	\$236,000	\$274,000	\$229,000		\$2,655,000
2001	\$643,000	\$422,000	\$923,000	\$350,000	\$305,000	\$232,000		\$2,875,000
2002	\$513,000	\$438,000	\$864,000	\$363,000	\$323,000	\$246,000	\$353,000	\$3,100,000
2003	\$515,000	\$454,000	\$816,000	\$340,000	\$295,000	\$243,000	\$25,000	\$2,688,000
2004	\$601,000	\$456,000	\$865,000	\$372,000	\$344,000	\$250,000	\$54,000	\$2,942,000
<b>Total</b>	<b>\$4,061,000</b>	<b>\$3,180,000</b>	<b>\$5,860,000</b>	<b>\$2,364,000</b>	<b>\$2,147,000</b>	<b>\$1,651,000</b>	<b>\$432,000</b>	<b>\$19,695,000</b>

\* NESCAUM is the Northeast States for Coordinated Air Use Management, an interstate association of air quality control divisions in the Northeast states.

**What is the PM<sub>2.5</sub> implementation rule?**

EPA is developing a new rule outlining how the Agency expects areas to implement the PM<sub>2.5</sub> standards. This implementation rule will address issues in the planning process, such as the requirements for attainment demonstrations, reasonable further progress, conformity, and control measures required for nonattainment areas.

**What are the new attainment dates?**

Nonattainment areas are expected to attain standards by early 2010, with a 5-year extension possible under some circumstances. EPA's final PM<sub>2.5</sub> implementation rule will set forth attainment dates for the nonattainment areas.

**What is the legal authority for making designations?**

Section 107 of the Clean Air Act gives EPA authority to make these designations. Under this section, any time EPA issues a new or revised national ambient air quality standards, state governors must submit a list of all areas to be designated as nonattainment. That list must include any area that does not meet the national air quality standards for a pollutant, along with any area that contributes to poor air quality in a nearby area that does not meet the standards. The EPA Administrator makes final nonattainment designations, through a rulemaking action. On

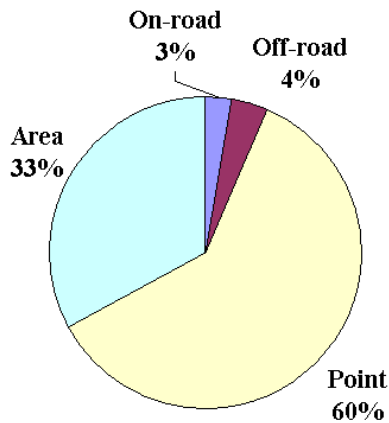
December 17, 2004, EPA Administrator Leavitt signed the final notice. Once designations take effect in February, 2004, they become an important component of state and local governments' efforts to reduce fine particle pollution. By law, nonattainment areas are subject to a number of requirements to reduce fine particle pollution.

### What sources contribute to New England's air pollution problem?

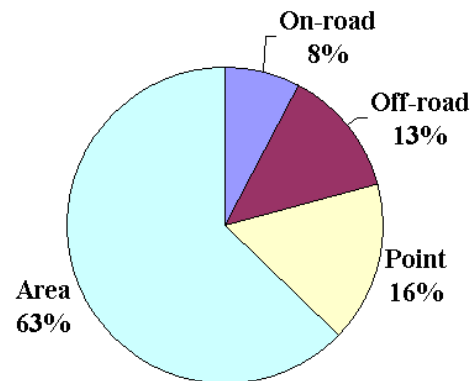
EPA recently released its preliminary 2002 emissions inventory estimates. The chart below shows the relative contribution of each major sector to fine particle precursor emissions in New England.

## 2002 Air Emission Estimates for New England

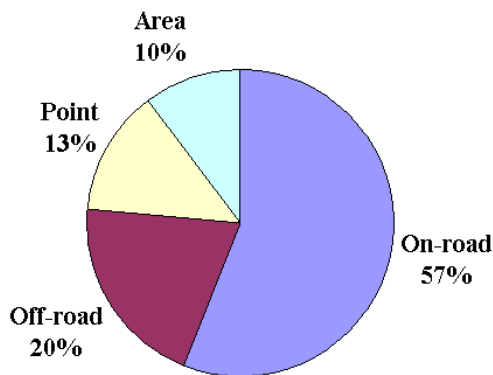
**SO<sub>2</sub> Emissions**



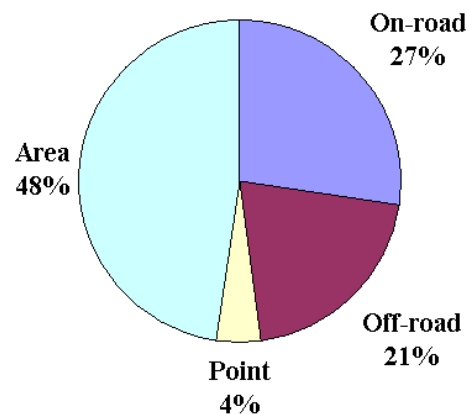
**PM<sub>2.5</sub> Emissions**



**NO<sub>x</sub> Emissions**



**VOC Emissions**



Point = large industry such as electric utilities and manufacturers

Area = smaller sources such as commercial and residential fuel combustion

On-road = motor vehicles such as passenger vehicles, buses and trucks

Off-road = engines used in diverse equipment used in construction, farming, lawn-care, etc.

## **What are EPA and the New England states doing to reduce these emissions?**

In the last few years, EPA and the states have adopted control measures that will help to improve future air quality. These federal and state air quality control measures will reduce pollution from both in-state and upwind sources. These strategies include:

### Power Plants

- ▶ EPA has taken aggressive steps to reduce pollution from power plants in the eastern United States. Nineteen eastern states and the District of Columbia have adopted requirements that establish emission caps on the amount of nitrogen oxide emissions that can be emitted from power plants from May through September each year. These emissions caps resulted in a reduction of approximately 600,000 tons of nitrogen oxide emissions by the summer of 2004.
- ▶ In Connecticut and Massachusetts, recent regulations require significant reductions of SO<sub>2</sub> and NO<sub>x</sub> from the largest power plants.
- ▶ The Administration's proposed clean air interstate rule is designed to dramatically reduce and permanently cap emissions of sulfur dioxide and nitrogen oxides from electric utilities. The proposed rule would apply to 29 eastern states and the District of Columbia that were found to contribute to unhealthy levels of fine particulate in downwind states. Under the proposed rule, SO<sub>2</sub> emissions would be reduced by 3.6 million tons in 2010 (approximately 40 percent below 2002 levels) and by another 2 million tons per year when the rules are fully implemented (approximately 70 percent below 2002 levels). NO<sub>x</sub> emissions would be cut by 1.5 million tons in 2010 and 1.8 million tons annually in 2015 (about 65 percent below 2002 levels).

### Highway Vehicle Standards

- ▶ EPA has set very stringent standards for passenger vehicles. Beginning model year 2004, new cars, pick-up trucks, and sport utility vehicles are 77 to 95 percent cleaner than vehicles already on the road.
- ▶ Also beginning in 2004, EPA is requiring the sulfur content of gasoline be reduced by 90 percent.
- ▶ Once fully implemented, these new tailpipe and gasoline sulfur standards will achieve the equivalent of removing the pollution created by 164 million cars.

### Truck and Bus Standards

- ▶ EPA has set very stringent standards for heavy duty trucks and buses. Beginning in model year 2004, heavy duty trucks and buses are reducing NO<sub>x</sub> emissions by more than 40 percent. In 2007, these vehicles will meet even more stringent standards that will reduce both PM and NO<sub>x</sub> emissions by more than 90 percent.
- ▶ Starting in June 2006, EPA will require the sulfur content of diesel fuel to be reduced by 97 percent.
- ▶ Once fully implemented, the 2007 emission standards and new diesel sulfur restrictions will achieve the equivalent of removing the pollution created by 13 million trucks and buses.

## Non-road Standards

- ▶ EPA has finalized stringent emission standards for new non-road diesel engines used in construction, agricultural and industrial operations. The Agency is also requiring a 99 percent reduction in the sulfur content in fuel used by these engines. The new emission standards and diesel sulfur restrictions will achieve a reduction in PM and NOx emissions of more than 90 percent from these engines.

## Diesel Retrofits

- ▶ A retrofitted diesel engine is cleaner either because it has been fitted with a device designed to reduce pollution and/or it uses a cleaner fuel. EPA is working with state and local governments to retrofit diesel engines used in a variety of applications, such as the following:

### Connecticut

- *Hartford, CT:* 200 school buses will be retrofitted and fueled with ultra-low sulfur diesel fuel (ULSD).
- *New Haven, CT:* CT DEP and CT DOT are requiring construction equipment used on the Q Bridge reconstruction project to be retrofitted with diesel exhaust controls. To date, 50 pieces of equipment have been retrofitted with oxidation catalysts.
- *New Haven, CT:* Yale University is using ULSD in their shuttle bus fleet.
- *Norwich, CT:* The entire fleet of 42 school buses has been retrofitted with either an oxidation catalyst or a particulate matter filter, and is using ULSD.
- *Stamford, CT:* 31 of the 48 buses in the Stamford CT transit fleet are equipped with particulate matter filters, and the entire fleet is fueled with ULSD.
- *Stamford, CT:* 35 school buses in Stamford have been retrofitted with oxidation catalysts.
- *New Haven:* 180 school buses are being retrofitted with oxidation catalysts and crankcase filters and the entire fleet is fueled with ULSD.
- *Bridgeport, CT:* 200 school buses will be retrofitted and fueled with ULSD.

### Maine

- *Statewide:* With grant funds from EPA's Clean School Bus USA program and significant matching funds from the state, the Maine Department of Environmental Protection is retrofitting over 400 school buses with oxidation catalysts.

### Massachusetts

- *Boston, MA:* The MBTA is using ULSD in all of its diesel buses. The MBTA is retrofitting all of its existing and new diesel buses with particulate matter filters. By the end of 2004, almost 600 of these retrofitted buses will be in service. In addition, 358 transit buses run on compressed natural gas (CNG).
- *Boston, MA:* As a result of two different supplemental environmental projects (resulting from the settlement of enforcement cases) the MBTA will use low sulfur (highway) diesel fuel in the 55 commuter trains operating out of North Station and South Station. In addition, the MBTA will equip between 15 and 20 commuter trains operating out of North Station with retrofit control equipment.

- *Boston, MA:* With funds from two separate supplemental environmental projects, the city of Boston is retrofitting the entire fleet of 600 school buses with particulate matter filters or oxidation catalysts and fueling these buses with ULSD.
- *Boston, MA:* More than 120 construction vehicles used on the Big Dig -- 25% of the construction vehicles for the project -- were retrofitted with oxidation catalysts.
- *Greater Boston, MA:* The Medical Academic and Scientific Community Organization (MASCO), owner of the shuttle buses that serve the Longwood Medical area in Boston, is the first private fleet in New England to install particulate matter filters and use ULSD in their fleet of 17 buses.
- *Boston, MA:* With EPA grant funds, two tourist trolley companies have retrofitted 36 trolleys with oxidation catalysts and some trolleys are being fueled with ULSD.
- *Medford, MA:* With grant funds from EPA's Clean School Bus USA program, Medford will retrofit 70 school buses with particulate matter filters or oxidation catalysts and fuel them with ULSD.

#### New Hampshire

- *Manchester/Nashua, NH:* With grant funds from EPA's Clean School Bus USA program, Manchester and Nashua will retrofit 45 school buses with oxidation catalysts.

#### Rhode Island

- *Statewide:* As a result of a supplemental environmental project, the Rhode Island Public Transit Authority is fueling 156 buses with ULSD and plans to retrofit all buses with particulate matter filters.
- *Warwick, RI:* With grant funds from EPA's Clean School Bus USA program, Warwick will retrofit 40 school buses with particulate matter filters and oxidation catalysts and fuel the entire fleet of 70 buses with ultra-low sulfur biodiesel.

#### Public Outreach

- Each weekday, in cooperation with the Northeastern states, EPA Region 1 prepares an air quality forecast for the general public to inform them about predicted air quality and associated health effects. These forecasts are posted to EPA's web site [www.epa.gov/ne/aqi](http://www.epa.gov/ne/aqi). When poor air quality is predicted, EPA and the states also issue press releases and air quality alerts.